

Alternative Theory of Disentanglement with Implications for Entanglement Based Communication

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Introduction

It has long been assumed that when outside influences “break” a quantum entanglement-based connection between two particles, that this is breaking of an entanglement is akin to severing a rope in a world of particles which are largely, unconnected.

However, this paradigm may be entirely wrong and this fundamentally incorrect assumption may prevent researchers from further developing their understanding of the phenomenon of entanglement.

Abstract

I would posit that entanglement between particles is the rule rather than the exception to the rule. When two ostensibly entangled particles come into proximity with outside influences such as direct contact with other particles, this, superficially, appears to result in the discontinuation of the entangled condition. What is actually transpiring, however, is that an outside particle, already subject to an enormously complex series of prior entanglements resulting from prior interactions with shared gravitational fields, alters the relationship between the ostensibly entangled particles so that actuation of those particles results in changes to other, outside particles which previously interacted with the contaminating particle. The other of the initial pair ceases, consequently, to be actuated by the affected member of the pair and this has led researchers to conclude that a mere severance of a link is what is being observed.

It may, however, be possible that these interactions with outside particles are, rather, creating a new quantum link mediated by the contaminating particle the terminus of which is some other particle. We may experimentally verify this hypothesis through the careful use of a secondary entangled pair.

If we were to introduce, as the contaminating particle, a particle which is a member of a secondary per se entangled pair, we may watch the other of the secondary set for evidence of its acting as the terminus of actuations originating in the primary set and could use such an experiment to verify this hypothesis. It could be predicted that under the condition that a contaminating particle originating in another per se entangled pair is used as the contaminating particle rather than a randomly selected particle, that a single interaction leading to the breakage of the entanglement of the first pair would not break the entanglement at all, but would rather change the routing of the entangled series.

Thus, we could create a pair known as “Pair A” consisting of particle #1 and particle #2 (A1 and A2.) In addition, we could create a pair known as “Pair B”

consisting of particle #1 and particle #2 (B1 and B2.) When we take B2 and cause it to interact with A2, the link between A1 and A2 appears to break. However, by continuing to monitor B1 within that closed system, we can wait to see if actuations of A2 (the contaminated particle) result in changes to B1 rather than to A1, the particle with which it was originally entangled. Although experiments have been run to see if a contaminating particle can supplant an originally tethered particle and this behavior has not been observed, no experiment has been run to see if that contaminating particle could be taking on the role of a bridge to particles outside of the controlled system.

As no one; to this author's knowledge; has ever conducted such an experiment, it is not entirely clear what the result of such an experiment would be. However, it is this author's belief that a new entanglement would actually be created between A2 and B1 under this condition, despite A2 and B1 never having been directly entangled through conventional methods. B2 would appear ostensibly untethered but would, in reality, be serving as a quantum mechanical bridge. A1, would appear to become untethered but would, in reality, remain connected in a different manner. No matter where B2 may be moved, B2 would continue to serve as such a bridge. A1, importantly, does not cease to be part of the network.

In this cross-networking regime, any actuation made through changes made to A2 (formerly directly linked to A1) would manifest not in A1, but rather, in B1. This could allow for direct communication between two distant parties *without the generation of interference*. When the party holding the "A" pair of particles wants to send a message, it would do so by actuating the A2 particle and the other party would "listen" for changes to its B1 particle. When the party holding the B-Pair wishes to send a message, it would do so by actuating the B2 particle and the first party would listen through its A1 particle. One particle, in this system, acts as a transmit key on a radio and the other as the receiver. If one party is using particle #2 as its transmit key, you know the other party must use its particle #1 as its own.

Conclusion

Beyond novel communications systems, the recognition of the fact that quantum *disentanglement* is impossible, but is rather an illusion created by a network of entanglement of ever-growing complexity and indiscernible interdependencies entirely contradicts a century of doctrine on the topic of quantum entanglement. With each particle interaction, the sequence of actuation in an entangled set including which particles act as bridges and which act as terminals of actuation may be altered.

Although there is no way of mapping organic entanglements outside of controlled systems, sets of controlled systems may be permitted to briefly interact with one another prior to be re-segregated into their discrete compartments in order to form a cross-linked quantum communications network which enables two-way communication without interference.

The viability of this approach is subject only to experimental verification and proof of concept.